

NASA TECH BRIEF



NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Division, NASA, Code UT, Washington, D.C. 20546.

Nonflammable Organic Adhesives Effective Over Wide Temperature Range

A series of highly fluorinated polyurethanes have been prepared as a basis for the development of non-flammable structural adhesives for use over a wide temperature range. The backbone of these polyurethanes is the polyether of perfluoropropylene oxide (PFPO). A typical member of this series of polyurethanes is prepared in a number of steps involving reaction between the hydroxyl-terminated polyether of PFPO and 1-chloro-3, 5, 6-trifluoro-m-phenylene diisocyanate. An adhesive system developed from the resultant polyurethane (isocyanate-terminated polyether of PFPO) exhibited adequate strength properties over the range of -320° to $+150^{\circ}\text{F}$ and was self-extinguishing in oxygen-rich atmospheres. Other derivatives of the basic fluorinated polyurethane employing specific curing and tackifying agents show promise for development into a broad range of non-flammable adhesives which will provide effective bonding of suitably prepared structural surfaces at temperatures extending from -320° to $+330^{\circ}\text{F}$.

Notes:

1. Owing to their excellent fire resistance and other unique properties, the fluorinated polyurethanes

should be evaluated for use as potting and encapsulating compounds, elastomers, coatings, films, and foams, as well as adhesives.

2. The following documentation may be obtained from:

Clearinghouse for Federal Scientific
and Technical Information
Springfield, Virginia 22151
Single document price \$3.00
(or microfiche \$0.65)

Reference:

NASA-CR-102176(N70-18706), Development
of Nonflammable Adhesives

Patent status:

No patent action is contemplated by NASA.

Source: Al McLeod of
Whittaker Corp.
under contract to
Manned Spacecraft Center
(MSC-13586)

Category 04

